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CASE REPORT

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Management of a complex traumatic dental injury: Crown, crown-root, and root fracture

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Abstract

Dental trauma can result in different kinds of injuries based on the extent, direction, and location of the impact. Multidisciplinary management of traumatized teeth is critical for successful treatment and improvement of the prognosis.

KEYWORDS

complex, crown fracture, root fracture, trauma

1 | INTRODUCTION

This paper reports on the management of a complex traumatic injury involving crown, crown-root, and root fractures, using a multidisciplinary approach, including endodontic, periodontal, orthodontic, and prosthodontic considerations. The healing pattern of the horizontal root fracture involved calcified tissue and the treatment resulted in secured periodontal health and good esthetics.

Traumatic dental injuries have increased during the last few years; such injuries might be caused by falls and collisions, physical activities, and accidents. All over the world, according to many published works, 15.5% of adolescents and young adults aged 7 and 20 years old sustain traumas in at least one permanent tooth.[1] The anterior teeth, especially the maxillary central incisors, and less frequently, mandibular central incisors, and maxillary lateral incisors comprise the teeth with significant traumas.[2] Dental traumas can result in different kinds of injuries depending on the extent, direction, location of the impact, and tooth development stage. According to current clinical classifications, crown, crown-root, and root fractures are the common injuries to the hard dental tissues and the pulp.[3] Crown fractures involve fractures or cracks of the enamel and/or dentin, with or without loss of tooth substance. They are defined as complicated, in the case of pulp exposure, or uncomplicated when the pulp is not exposed after trauma. When a fracture involves enamel, dentin, and cementum and extends below the gingival margin, it is defined as crown-root fracture. In root fractures, only the root structure including dentin, cementum, and pulp is involved and it can be localized at the apical, middle, or cervical third.[3]

Following diagnosis of a traumatic injury, a treatment plan should be established according to the type of the fracture, stage of tooth development, endodontic prognosis and periodontal, restorative and prosthodontics considerations. For complicated crown fractures, treatment options are vital pulp therapy and pulpectomy. These options can be considered for crown-root fractures; however, the prosthetic coronal restoration is unfavorable because the fracture line extends to the root below the crestal bone. Three approaches can be selected to reestablish the biological width and make the tooth restorable: (a) orthodontic extrusion, (b) surgical extrusion, and (c) crown lengthening. Orthodontic extrusion is superior due to the better management of esthetic concerns and coronal displacement of crestal bone and gingival margin. To avoid any relapse, circumferential supracrestal fiberotomy should be performed after extrusion. For root fractures, repositioning the coronal fragment and immobilizing the tooth with splint are choices of treatment. When the fracture is located in the apical or middle third of the root, the prognosis is favorable.[4-6]